

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C. 20231  
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year)

14 December 1999 (14.12.99)

International application No.

PCT/US99/08802

Applicant's or agent's file reference

02441.80414

International filing date (day/month/year)

22 April 1999 (22.04.99)

Priority date (day/month/year)

22 April 1998 (22.04.98)

Applicant

PALIARD, Xavier

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

19 November 1999 (19.11.99)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

A. Karkachi

Telephone No.: (41-22) 338.83.38

# INTERNATIONAL PATENT COOPERATION TREATY

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BLACKBURN, Robert P.  
CHIRON CORPORATION  
Intellectual Property - R338  
P.O. Box 8097  
Emeryville, CA 94662-8097  
ETATS-UNIS D'AMERIQUE

PCT

WRITTEN OPINION

(PCT Rule 66)



Date of mailing (day/month/year)		31.03.2000
Applicant's or agent's file reference 1521.100		REPLY DUE within 3 month(s) from the above date of mailing
International application No. PCT/US99/08802	International filing date (day/month/year) 22/04/1999	Priority date (day/month/year) 22/04/1998
International Patent Classification (IPC) or both national classification and IPC C12N15/36		
Applicant CHIRON CORPORATION et al.		

- This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
- This opinion contains indications relating to the following items:
  - ☒ Basis of the opinion
  - ☐ Priority
  - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☒ Lack of unity of invention
  - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Certain document cited
  - ☐ Certain defects in the international application
  - ☒ Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 22/08/2000.

4/13/00  
AAH FA  
1521.100  
EXL  
6/30/00 RSB

Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer / Examiner Petri, B Formalities officer (incl. extension of time limits) Vullo, C Telephone No. +49 89 2399 8061
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## WRITTEN OPINION

International application No. PCT/US99/08802

### I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

#### Description, pages:

1-14 as originally filed

#### Claims, No.:

1-29 as originally filed

#### Drawings, sheets:

1/5-5/5 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

### IV. Lack of unity of invention

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with for the following reasons

## WRITTEN OPINION

International application No. PCT/US99/08802

and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:

**see separate sheet**

3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this opinion:

☒ all parts.

☐ the parts relating to claims Nos. .

### V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

#### 1. Statement

Novelty (N)                      Claims    1-2, 5-8, 10-21, 25-29

Inventive step (IS)              Claims    3-4, 23-24

Industrial applicability (IA)      Claims

#### 2. Citations and explanations

**see separate sheet**

### VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**WRITTEN OPINION  
SEPARATE SHEET**

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International application No. PCT/US99/08802

**Re Item IV**

**Lack of unity of invention**

The international search report has been drawn up in respect of the entire international application but the IPEA is of the opinion that the application does not comply with the requirements of unity of invention as set forth in the PCT regulations (Article 34(3), Rules 13 and 68 PCT):

The separate inventions/groups of inventions are:

An immunogenic composition, comprising a DNA immunogen; and a chemokine or a polynucleotide encoding a chemokine and methods of enhancing an immune response comprising administering a chemokine and a DNA immunogen, wherein the immunogen is:

- (i) a viral immunogen and the chemokine is MIP-1a
- (ii) an immunogen expressed by a tumor and the chemokine is MIP-1a
- (iii) a viral immunogen and the chemokine is BLC
- (iv) an immunogen expressed by a tumor and the chemokine is BLC

The common concept linking together above group of inventions is the immunogenic composition, comprising a DNA immunogen; and a chemokine or a polynucleotide encoding a chemokine (claim 1).

This concept is not novel (see item V).

Furthermore as also viral immunogenes are known in the composition of claim 1, additional group of inventions arise, consisting of hepatitis C virus non-structural polypeptides (claim 3) and HIV polypeptides (claim 5) and any subject-matter resulting from combinations with the chemokines of claim 8 and 9.

However, in the light of the findings below (see item V) and since all the invention groups can be subjected to IPE with reasonable additional effort, the IPER will cover all group of inventions.

The applicant must be aware of a possible objection because of lack of unity in any

regional phase of the present application.

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: WO 96 36366 A (DOW STEVE W ;ELMSLIE ROBYN E (US); NAT JEWISH CENTER FOR IMMUNOLO) 21 November 1996 (1996-11-21)
- D2: WO 96 11279 A (US HEALTH) 18 April 1996 (1996-04-18)
- D3: WO 98 15285 A (WISTAR INST ;ERTL HILDEGUND C J (US); THURIN MAGDALENA (US)) 16 April 1998 (1998-04-16)
- D4: KHUDYAKOV Y E ET AL: 'LINEAR B-CELL EPITOPES OF THE NS3-NS4-NS5 PROTEINS OF THE HEPATITIS C VIRUS AS MODELED WITH SYNTHETIC PEPTIDES' VIROLOGY, vol. 206, 1 January 1995 (1995-01-01), pages 666-672, XP000574456 ISSN: 0042-6822

**Novelty, Article 33(2), PCT**

D1 discloses immunogenic compositions and methods of enhancing an immune response, comprising DNA immunogens coding for viral antigens and a chemokine or a polynucleotide encoding said chemokine (i.e. MIP1a) (page 6, line 23 - page 7 line 28; page 14 line 13; Examples 12-16; Claims 1, 2, 10-12, claim 53-62, claim 80-85). This disclosure anticipates the subject-matter of claims 1-2, 8, 10, 11-21, 27-29.

D2 discloses immunogenic compositions and methods of enhancing an immune response, comprising DNA immunogens coding for viral antigens (i.e. HIV, p17; page 27 line 14) and/or tumor antigens and a chemokine or a polynucleotide encoding said chemokine (i.e. MIP1a) (page 8, line 14-20; page 28, line 6; Claims 8-10; claim 18, claim 24-25). This disclosure anticipates the subject-matter of claims 1-2, 5-8, 10-21, 25-29.

D3 discloses immunogenic compositions and methods of enhancing an immune response, comprising DNA immunogens coding for tumor antigens and a chemokine or a polynucleotide encoding said chemokine (page 4, line 24 - page 5 line 1; page 16 line 22-24; Example 13). This disclosure anticipates the subject-matter of claims 1-2, 7, 10, 11-20, 27-29.

In summary, in view of above prior art the subject-matter of claim 1-2, 5-8, 10-21, 25-29 is considered to lack novelty.

**Inventive step, Article 33(3), PCT**

Claim 3-4, 23-24 refer to HCV non structural polypeptides (i.e. NS3, NS4, NS5a,b) to be chosen as DNA immunogen. As however, these peptides are known to comprise strong antigenic epitopes recognized by antisera from patients infected with HCV (D4, Abstract, Table 1 and 2) their selection for the composition and methods of claim 1 and 11 is considered not to involve an inventive step.

As shown by the applicant, not all chemokines are equally suitable for the composition and method proposed in claim 1 and 11 (see below item VIII). As such, the selection of specific chemokines, that exhibit an enhancing effect on the response against a DNA immunogen is considered an inventive contribution to the art. Consequently employment of the chemokine BLC (claim 9, 22) in the composition of claim 1 and in the method of claim 11 appears to be inventive.

**Industrial applicability, Article 33(4), PCT**

For the assessment of the present claims 11-29 on the question whether they are industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

**WRITTEN OPINION  
SEPARATE SHEET**

International application No. PCT/US99/08802

**Re Item VI**

**Certain documents cited**

**Certain published documents (Rule 70.10)**

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
WO 99/29728	17.06.1999	11.12.1998	11.12.1997

**Re Item VIII**

**Certain observations on the international application**

The present application provides evidence that selected chemokines can enhance the immune response to a DNA immunogen.

Examples are provided which relate to the effect on cytotoxic T cell response to HCV NS3 in a cytotoxic T cell assay after coadministration of plasmids encoding for specific HCV antigens (i.e.  $\Delta$ NS3, NS4, NS5a and NS5b) and specific cytokines (GM-CSF) and/or chemokines (RANTES, MIP1 $\alpha$ ) to baboons (Example 1). In addition, the effect of coadministration of HIV p55 with the chemokine BLC on anti-gag antibody titer is reported (Fig. 5).

Of the examples studied only MIP1 $\alpha$  and BLC have shown a positive effect on the immune response against the DNA immunogens (Table 1 and 2; Fig. 5). Consequently, as apparently not all chemokines promote an enhanced immune response, any broadening beyond the chemokines exemplified (i.e. MIP1 $\alpha$  claim 8, 21 and BLC claim 9, 22) is considered unjustified. Therefore, as also chemokines are embraced by the subject-matter of claims 1-7, 10, 11-20, 23-29 for which no positive effect has been shown (e.g. RANTES, Table 1), the invention cannot be carried out over the entire scope of said claims. Consequently claims 1-7, 10, 11-20, 23-29 are considered not to comply with the requirements of Article 5 and 6, PCT.



## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>02441.80414</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/US 99/08802</b>	International filing date (day/month/year) <b>22/04/1999</b>	(Earliest) Priority Date (day/month/year) <b>22/04/1998</b>
Applicant <b>CHIRON CORPORATION et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

**ENHANCING IMMUNE RESPONSES TO GENETIC IMMUNIZATION BY USING A CHEMOKINE**

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 99/08802

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
Remark: Although claims 11-29 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International Application No.

T/US 99/08802

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/36 C12N15/49 A61K48/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 96 36366 A (DOW STEVE W ;ELMSLIE ROBYN E (US); NAT JEWISH CENTER FOR IMMUNOLO) 21 November 1996 (1996-11-21) page 6, line 19 -page 8, line 18  page 17, line 24 -page 20, line 3 page 53, line 4 -page 56, line 23 page 89, line 5 -page 92, line 15 ---	1,2,7,8, 10-21, 27-29 3-6, 23-26
X Y	WO 94 28916 A (BRITISH BIOTECH PHARM ;COMER MICHAEL BERISFORD (GB); MCCOURT MATTH) 22 December 1994 (1994-12-22) page 4, line 31 -page 5, line 11  page 14, line 24 -page 17, line 27 page 25, line 20 -page 26, line 6 --- -/--	1,2,5-8, 10-21, 25-29 3,4,23, 24

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

19 October 1999

Date of mailing of the international search report

03/11/1999

Name and mailing address of the ISA

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Authorized officer

Sitch, W

## INTERNATIONAL SEARCH REPORT

International Application No

T/US 99/08802

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 15285 A (WISTAR INST ;ERTL HILDEGUND C J (US); THURIN MAGDALENA (US)) 16 April 1998 (1998-04-16) page 4, line 24 -page 6, line 28 ---	1,7, 10-20, 27-29
X	WO 96 11279 A (US HEALTH) 18 April 1996 (1996-04-18)  page 18, line 20 -page 21, line 29 page 24, line 29 -page 28, line 7 ---	1,2,5-7, 10-21, 25-29
Y	KHODYAKOV Y E ET AL: "LINEAR B-CELL EPITOPES OF THE NS3-NS4-NS5 PROTEINS OF THE HEPATITIS C VIRUS AS MODELED WITH SYNTHETIC PEPTIDES" VIROLOGY, vol. 206, 1 January 1995 (1995-01-01), pages 666-672, XP000574456 ISSN: 0042-6822 page 666 abstract ---	3,4,23, 24
Y	MOLDOVEANU Z ET AL: "IMMUNE RESPONSES INDUCED BY ADMINISTRATION OF ENCAPSIDATED POLIOVIRUS REPLICONS WHICH EXPRESS HIV-1 GAG AND ENVELOPE PROTEINS" VACCINE, vol. 13, no. 11, 1 August 1995 (1995-08-01), pages 1013-1022, XP000571592 ISSN: 0264-410X page 1013 abstract ---	5,6,25, 26
A	WO 97 19696 A (LUSSO PAOLO ;GALLO ROBERT C (US); COCCHI FIORENZA (US); VICO ANTHO) 5 June 1997 (1997-06-05) page 4, line 11 -page 5, line 20 ---	
A	DILLOO ET AL: "COMBINED CHEMOKINE AND CYTOKINE GENE TRANSFER ENHANCES ANTITUMOR IMMUNITY" NATURE MEDICINE, vol. 2, no. 10, October 1996 (1996-10), pages 1090-1095, XP002119425 page 1090 abstract ---	
E	WO 99 29728 A (GALLO ROBERT C ;DEVICO ANTHONY L (US); GARZINO DEMO ALFREDO (US);) 17 June 1999 (1999-06-17) page 12, paragraph 3 -page 25, paragraph 2 -----	1,2,5,6, 8-22, 25-29

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/08802

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9636366 A	21-11-1996	US 5705151 A	06-01-1998
		US 5935568 A	10-08-1999
		AU 704012 B	01-04-1999
		AU 5801696 A	29-11-1996
		CA 2221305 A	21-11-1996
		EP 0850071 A	01-07-1998
		JP 11508762 T	03-08-1999
WO 9428916 A	22-12-1994	AU 6974294 A	03-01-1995
		EP 0703784 A	03-04-1996
		JP 8511263 T	26-11-1996
		US 5925568 A	20-07-1999
		ZA 9404258 A	15-12-1995
WO 9815285 A	16-04-1998	AU 4907797 A	05-05-1998
WO 9611279 A	18-04-1996	AU 3998295 A	02-05-1996
		CA 2201592 A	18-04-1996
		EP 0789774 A	20-08-1997
WO 9719696 A	05-06-1997	AU 1141997 A	19-06-1997
		EP 0869812 A	14-10-1998
WO 9929728 A	17-06-1999	AU 1815899 A	28-06-1999

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>C12N 15/36, 15/49, A61K 48/00</b>		<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 99/53960</b>
			<b>(43) International Publication Date:</b> 28 October 1999 (28.10.99)
<b>(21) International Application Number:</b> PCT/US99/08802		<b>(81) Designated States:</b> CA, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
<b>(22) International Filing Date:</b> 22 April 1999 (22.04.99)		<b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
<b>(30) Priority Data:</b> 60/082,600                      22 April 1998 (22.04.98)                      US		<b>(88) Date of publication of the international search report:</b> 23 December 1999 (23.12.99)	
<b>(63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application</b> US    60/082,600 (CIP) Filed on    22 April 1998 (22.04.98)			
<b>(71) Applicant (for all designated States except US):</b> CHIRON CORPORATION [US/US]; Intellectual Property - R440, P.O. Box 8097, Emeryville, CA 94622-8097 (US).			
<b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> PALIARD, Xavier [US/US]; Chiron Corporation, P.O. Box 8097, Emeryville, CA 94622-8097 (US).			
<b>(74) Agents:</b> HARBIN, Alisa, A. et al.; Chiron Corporation, Intellectual Property - R440, P.O. Box 8097, Emeryville, CA 94622-8097 (US).			
<b>(54) Title:</b> ENHANCING IMMUNE RESPONSES TO GENETIC IMMUNIZATION BY USING A CHEMOKINE			
<b>(57) Abstract</b> <p>The immune response to a DNA immunogen in a mammal can be enhanced by administration of a chemokine or a polynucleotide encoding the chemokine. This method can be used, for example, to immunize or vaccinate a mammal against an infectious disease or a tumor.</p>			

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EE	Estonia			SG	Singapore		

## INTERNATIONAL SEARCH REPORT

National Application No

PCT/US 99/08802

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/36 C12N15/49 A61K48/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 36366 A (DOW STEVE W ;ELMSLIE ROBYN E (US); NAT JEWISH CENTER FOR IMMUNOLO) 21 November 1996 (1996-11-21)	1,2,7,8, 10-21, 27-29
Y	page 6, line 19 -page 8, line 18  page 17, line 24 -page 20, line 3 page 53, line 4 -page 56, line 23 page 89, line 5 -page 92, line 15 ---	3-6, 23-26
X	WO 94 28916 A (BRITISH BIOTECH PHARM ;COMER MICHAEL BERISFORD (GB); MCCOURT MATTH) 22 December 1994 (1994-12-22)	1,2,5-8, 10-21, 25-29
Y	page 4, line 31 -page 5, line 11  page 14, line 24 -page 17, line 27 page 25, line 20 -page 26, line 6 --- -/--	3,4,23, 24



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

19 October 1999

Date of mailing of the international search report

03/11/1999

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Authorized officer

Sitch, W



# INTERNATIONAL SEARCH REPORT

Patent Application No  
PCT/US 99/08802

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 15285 A (WISTAR INST ;ERTL HILDEGUND C J (US); THURIN MAGDALENA (US)) 16 April 1998 (1998-04-16) page 4, line 24 -page 6, line 28 ----	1,7, 10-20, 27-29
X	WO 96 11279 A (US HEALTH) 18 April 1996 (1996-04-18)  page 18, line 20 -page 21, line 29 page 24, line 29 -page 28, line 7 ----	1,2,5-7, 10-21, 25-29
Y	KHUDYAKOV Y E ET AL: "LINEAR B-CELL EPITOPES OF THE NS3-NS4-NS5 PROTEINS OF THE HEPATITIS C VIRUS AS MODELED WITH SYNTHETIC PEPTIDES" VIROLOGY, vol. 206, 1 January 1995 (1995-01-01), pages 666-672, XP000574456 ISSN: 0042-6822 page 666 abstract ----	3,4,23, 24
Y	MOLDOVEANU Z ET AL: "IMMUNE RESPONSES INDUCED BY ADMINISTRATION OF ENCAPSIDATED POLIOVIRUS REPLICONS WHICH EXPRESS HIV-1 GAG AND ENVELOPE PROTEINS" VACCINE, vol. 13, no. 11, 1 August 1995 (1995-08-01), pages 1013-1022, XP000571592 ISSN: 0264-410X page 1013 abstract ----	5,6,25, 26
A	WO 97 19696 A (LUSSO PAOLO ;GALLO ROBERT C (US); COCCHI FIORENZA (US); VICO ANTHO) 5 June 1997 (1997-06-05) page 4, line 11 -page 5, line 20 ----	
A	DILLOO ET AL: "COMBINED CHEMOKINE AND CYTOKINE GENE TRANSFER ENHANCES ANTITUMOR IMMUNITY" NATURE MEDICINE, vol. 2, no. 10, October 1996 (1996-10), pages 1090-1095, XP002119425 page 1090 abstract ----	
E	WO 99 29728 A (GALLO ROBERT C ;DEVICO ANTHONY L (US); GARZINO DEMO ALFREDO (US);) 17 June 1999 (1999-06-17) page 12, paragraph 3 -page 25, paragraph 2 -----	1,2,5,6, 8-22, 25-29

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 99/ 08802

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
Remark: Although claims 11-29 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/08802

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